

Appendix C
Quality Assurance Project Plan

Corrective Measures Quality
Assurance Project Plan (QAPP)
Superior Tube Company
Evansburg, Pennsylvania

17 August 1999

Environmental Resources Management
855 Springdale Drive
Exton, Pennsylvania 19341

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	PROJECT ORGANIZATION AND RESPONSIBILITIES	2
2.1	PROJECT MANAGER	2
2.2	HYDROGEOLOGIC INVESTIGATION MANAGER	2
2.3	QUALITY ASSURANCE COORDINATOR	2
2.4	QUALITY ASSURANCE CHEMIST	2
2.5	LABORATORY COORDINATOR	3
2.6	HYDROGEOLOGIST	3
2.7	PROJECT GEOLOGISTS/TECHNICIANS	3
2.8	LABORATORY SAMPLE CUSTODIAN	3
3.0	QUALITY ASSURANCE OBJECTIVES	4
4.0	SAMPLING PROCEDURES	5
5.0	SAMPLE CUSTODY	6
6.0	CALIBRATION PROCEDURES AND FREQUENCY	7
7.0	ANALYTICAL PROCEDURES	8
8.0	DATA REPORTING, VALIDATION, AND REDUCTION	9
9.0	INTERNAL QUALITY CONTROL CHECKS	10
9.1	LABORATORY INTERNAL QUALITY CONTROL CHECKS	10
9.2	FIELD INTERNAL QUALITY CONTROL CHECKS	10
10.0	ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS	12
10.1	OVERALL PROJECT ASSESSMENT	12

10.2	<i>FIELD QUALITY ASSESSMENT</i>	12
10.3	<i>LABORATORY DATA QUALITY ASSESSMENT</i>	12
10.4	<i>LABORATORY DATA QUALITY ASSESSMENT</i>	13
10.5	<i>DATA MANAGEMENT QUALITY ASSESSMENT</i>	14
11.0	<i>LABORATORY CORRECTIVE ACTION</i>	15

This Quality Assurance Project Plan (QAPP) has been developed to present the quality assurance measures that will be used during implementation of the Interim Measure (IM) and Corrective Measure (CM) activities at the Superior Tube Company (Superior) facility located in Lower Providence Township, Montgomery County, Pennsylvania. This document has been prepared as part of the CM Design Report pursuant to the requirements of the 28 December 1998 Administrative Order on Consent (AOC) between Superior and the United States Environmental Protection Agency (EPA).

Superior is a specialty tube manufacturer with a facility located in Lower Providence Township, at the intersection of Germantown Pike and Cross Keys Road. The 96-acre site is situated along the French Run, a tributary of Perkiomen Creek.

Since 1935, Superior has owned and operated the facility for the manufacture of specialty, cold drawn, precision tubing and tubular parts. The principal operations include drawing, welding, degreasing, pickling, annealing, cutting, forming, grinding, polishing, coating, and sandblasting metal tubing.

A description of the facility history, nature and extent of contamination, and scope of the IMs and CMs can be found in the AOC and Section 1 of the CM Design Report.

The ongoing IMs, as well as the proposed CM implementation activities require a limited amount of sampling and, as such, will require a limited number of personnel. Because of the range of different IM and CM activities, Superior utilizes a range of appropriate consultants and laboratories to support the required sampling and analysis activities. As previously presented to the EPA, these personnel will be mobilized as required from Superior Tube Company, Environmental Resources Management (ERM), Environmental Alliance, SMC Environmental Services, Blue Marsh Laboratories, Q.C. Laboratories, Inc., Lancaster Laboratories, and other contractors as required.

A detailed organization chart for the CM activities was presented in the 26 February 1999 CMI Program Plan. Depending on the number of contractors and consultants involved at any one time, more than one person may serve each of the roles designated below.

2.1 PROJECT MANAGER

The PM will be responsible for the oversight and coordination of the various elements of the IMs and CMs, and will serve as the prime contact with governmental agencies.

2.2 HYDROGEOLOGIC INVESTIGATION MANAGER

The hydrogeologic investigation manager will manage those specific tasks requiring subsurface investigation and modeling.

2.3 QUALITY ASSURANCE COORDINATOR

The quality assurance coordinator responsibilities will include the review of project plans and revision of the plans to ensure that proper quality assurance is maintained.

2.4 QUALITY ASSURANCE CHEMIST

The quality assurance chemist will have primary responsibility for analytical data validation and review.

2.5 ***LABORATORY COORDINATOR***

The laboratory coordinator's responsibilities include coordinating communication between the project team and the contracted laboratories. Further duties will include scheduling analytical services, sample shipment, and tracking and filing chain-of-custody forms.

2.6 ***HYDROGEOLOGIST***

The lead hydrogeologist will be responsible for subsurface interpretation and review.

2.7 ***PROJECT GEOLOGISTS/TECHNICIANS***

All sampling tasks proposed in the CM Design Report, IM Work Plans, and associated documents will be conducted by experienced environmental geologists, environmental engineers, or environmental technicians. Their responsibilities will include following the designated sampling procedures, sampling preservation procedures, and chain-of-custody documentation.

2.8 ***LABORATORY SAMPLE CUSTODIAN***

The sample custodian's responsibilities include ensuring proper sample handling procedures by laboratory personnel.

The Quality Assurance objectives contained in the RFI QAPP are incorporated herein by reference.

Sampling activities associated with ongoing IMs at Superior have been conducted for a number of years, and additional sampling will continue in the future. These sampling activities have included and will include periodic and discrete sampling of soil, sediment, air, surface water and ground water as applicable. Major IM and CM activities that require sampling include the following:

- On-site and off-site sampling of ground water to support the performance evaluation of the TCE ground water recovery and treatment system;
- Sampling of ground water treatment system effluent;
- Sampling of soils and sediments in association with the final delineation and excavation of the SWMU 17, Outfall 002 and Outfall 004 areas;
- Sampling of ground water and air associated with the in-situ vapor extraction system; and
- Sampling of impacted ground water associated with SWMU 21 and related areas.

The detailed sampling requirements and procedures for these activities are presented in the CM Design Report and associated sampling plans, along with sampling plans submitted as part of previous IM activities.

The primary objective of the sample custody procedures is to create an accurate written record which can be used to trace the possession and handling of all samples from the moment of their collection through analysis until their final disposition. Custody for samples collected during the IM and CM activities will be maintained by the field personnel collecting the samples. The field personnel will be responsible for documenting each sample transfer and maintaining custody of all samples until they are shipped to the laboratory. Sample containers will be obtained directly from the laboratory. All necessary chemical preservatives will be added to the bottles prior to the sampling event.

A self-adhesive sample label will be affixed to each container at the time of sample collection. At a minimum, the sample label will contain the following information:

- Sample identification
- Date collected
- Time collected

The laboratory calibration procedures and frequency are as contained in the corresponding QA plans for the laboratories, which were presented in previous IM Work Plans and associated submittals, and are incorporated herein by reference. Unless otherwise indicated to the EPA, the calibration procedures and frequency utilized by the laboratories will be updated as appropriate to be consistent with the most current versions of the EPA test methods being utilized.

The Analytical Procedures from the RFI QAPP are incorporated herein by reference, with the addition of the Drinking Water Analysis Methods 502.2 and 524.2, and EPA-SW-846 Method 8260 for volatile organics, as appropriate. Also, the laboratory reference is changed to add Q.C., Inc., and Blue Marsh Laboratory, Inc. as approved laboratories for this project.

Data validation practices will be followed to ensure that raw data are not altered and that an audit trail is developed for those data which required reduction. All the field data such as those generated during field measurements, observations, and field instrument calibrations will be entered directly into a bound field notebook. Each project team member will be responsible for proofing all data transfers made.

Upon receipt of the sample data packages, the analytical data for the samples will be validated by the quality assurance chemist. Given the limited nature of the CM and ongoing IM sampling, it is anticipated that the data reduction efforts will be minimal, and will consist primarily of tabulating the analytical results into summary tables through the use of computerized spreadsheet software.

All analytical data obtained during the course of this work for ground water or drinking water samples will be reported in units of $\mu\text{g/L}$.

All raw field data will be summarized, reduced, or tabulated for use by the project manager. All laboratory analytical data will be summarized and tabulated upon receipt. The data will be completely validated and qualified and the final data submitted to the project team.

The Project Manager is responsible for maintaining a central file in which all accountable documents will be inventoried.

9.1

LABORATORY INTERNAL QUALITY CONTROL CHECKS

Q.C., Inc., Blue Marsh, and Lancaster Laboratory internal quality control checks were previously presented as attachments to IM Workplans.

9.2

FIELD INTERNAL QUALITY CONTROL CHECKS

To the extent appropriate, the following quality assurance/quality control samples will be included as part of the IM and CM sampling programs:

- Trip Blanks – These blanks consist of deionized water contained in each sample container with any preservatives required for that analysis. These blanks will accompany the samplers during the sampling process and will serve as QC check on container cleanliness, external contamination, and the analytical method.
- Equipment Rinsate Blank – Equipment rinsate blanks will be collected when appropriate to ensure that sampling equipment is clean and that the potential for cross-contamination has been minimized by the equipment decontamination procedures. These blanks will be collected by decontaminating the sampling device and then pouring deionized water over the device. This rinsate water will be collected into a clean stainless steel bowl and then transferred to the appropriate sample containers. An equipment rinsate blank will be collected for each major sampling event to include groundwater sampling. The equipment rinsate blanks will be analyzed for identical parameters as the samples.
- Duplicate Samples – Blind duplicate samples will be collected to allow determination of analytical and sampling precision. One duplicate sample in every twenty (20) rounds of water samples will be collected and submitted for the identical parameters as the true sample.
- Matrix Spike Sample – Matrix spike/matrix spike duplicates (MS/MSD) samples will also be submitted as further QC checks. These will be collected at the frequency of one MS and MSD for every twenty (20) field samples (including trip blanks, field blanks, and blind duplicates). These will allow accuracy to be determined by the recovery rates of compounds (the matrix spike and/or surrogate spike compounds defined in the analytical methods). Precision will also be assessed by

comparison of matrix spike duplicate recoveries. The purpose of these laboratory spikes is to monitor any possible matrix effects specific to samples collected from the Superior site. The addition of known concentrations of compounds/constituents into the sample also monitors extraction/digestion efficiency.

- Duplicate Laboratory Spike Duplicate - Duplicate laboratory spike duplicate (DLSD) samples will be submitted periodically in the data collection effort for this work. These samples will consist of on-site carbon filtered water which has a known spike amount added which will be split and sent to two different laboratories for comparative analysis.

10.0 *ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS*

10.1 *OVERALL PROJECT ASSESSMENT*

Overall data quality will be assessed by a thorough understanding of the data quality objectives stated previously. By thoroughly reviewing (validating) the analytical data as it is generated by the laboratory and providing appropriate feedback as problems arise the quality assurance coordinator can monitor data accuracy, precision, and completeness.

10.2 *FIELD QUALITY ASSESSMENT*

To ensure that all field data are collected accurately and correctly, the Project Manager or QA chemist will visit the sampling technician in the field during the initial sampling events of the investigation to verify that the appropriate procedures are being followed for sample (and blank) collection.

The evaluation (data review) of trip and field blanks and other field QC samples will provide definitive indications of the data quality. If a problem arises which can be isolated, corrective actions can be instituted for future field efforts.

10.3 *LABORATORY DATA QUALITY ASSESSMENT*

Laboratory personnel are responsible for assuring the quality of the analytical data generated. The laboratory analyst evaluates the data at the bench or instrument, making sure that specific quality control acceptance criteria are met. All data will be reviewed by the laboratory group leader prior to data deliverable generation to check for transcription errors and to ensure that specific quality control acceptance criteria are met and that corrective actions have been taken when necessary. All data deliverables will be reviewed by both the laboratory quality assurance manager and the laboratory manager prior to the release to the client. Specific measures that will be taken by each laboratory to assess data quality were presented in the previous respective laboratory attachments.

Except in those cases where data is required to be reported on a weekly basis, all analytical data generated during this work will undergo a data review. A preliminary review will be performed to verify all necessary paperwork (chain-of-custodies, analytical reports, laboratory personnel signatures) and deliverables are present in the data packages.

A more detailed quality assurance review of the analytical data will be performed by the quality assurance chemist or the quality assurance coordinator to verify the qualitative and quantitative reliability of the data as it is presented. This review will include a review and interpretation of all data generated by the respective laboratory. The primary tools which will be used by data review chemists will be guidance documents, contractual criteria, and professional judgment.

The following table presents the items to be examined during the Quality Assurance Review.

TABLE 10-1 ITEMS REVIEWED DURING THE ANALYTICAL DATA VALIDATION

<u>Area Examined</u>
Chain-of-Custodies
Holding Times
Blanks
Instrument Tune
Standards
Linearity
Sensitivity/Stability
EPA Criteria
Control Standards
Samples
Detection Limits
Instrument Printouts
GC Data
GC/MS Data
Quantitative Reliability
Calculations/Equations
Matrix Spikes (Accuracy)
Bias
Matrix Spikes Duplicated
Bias
Accuracy and Precision
Surrogate Spikes
Bias
Duplicated
Precision
Representativeness

As the analytical data generated from these activities are validated, qualified, and submitted to the Project Manager, the quality of the data will be assessed from an overall management perspective by direct comparison of analytical results obtained from previous sampling events. Information that can be obtained includes comparison of results obtained from samples taken and the identification of missing data points. By examination of the data at the "back end" of the process, the data quality can be assessed with respect to representativeness, precision, compatibility, and completeness.

The corrective actions to be taken by the respective laboratory will be as previously submitted in the respective laboratory quality assurance attachments.

Appendix D
Field Sampling Plan

Corrective Measures Field
Sampling Plan (FSP)
Superior Tube Company
Evansburg, Pennsylvania

17 August 1999

Environmental Resources Management
855 Springdale Drive
Exton, Pennsylvania 19341

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	PURPOSE AND CONTENT	1
1.2	GENERAL APPROACH	1
1.3	SWMUS 6 AND 8 (OUTFALLS 002 AND 004)	2
1.4	SWMU 17	3
2.0	FIELD SAMPLING ACTIVITIES	5
2.1	SOIL AND SEDIMENT SAMPLING	5
2.3	DECONTAMINATION OF SAMPLING EQUIPMENT	5
2.4	FIELD MEASUREMENTS AND FIELD NOTEBOOKS	5
2.5	QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES	6
2.6	HEALTH AND SAFETY	6
2.7	SURVEYING	6
2.8	DATA EVALUATION AND REPORTING	7

LIST OF TABLES

<i>1</i>	<i>Sample Summary Matrix</i>	<i>following page 2</i>
-----------------	-------------------------------------	--------------------------------

LIST OF FIGURES

<i>1</i>	<i>Soil/Sediment Sampling Exceedance Map for Outfall 002 (SWMU 6)</i>	<i>2</i>
<i>2</i>	<i>Soil/Sediment Sampling Exceedance Map for Outfall 004 (SWMU 8)</i>	<i>2</i>
<i>3</i>	<i>Soil/Sediment Sampling Exceedance Map for SWMU 17</i>	<i>3</i>

1.0 INTRODUCTION

1.1 PURPOSE AND CONTENT

This Field Sampling Plan (FSP) presents the provisions for the proposed soil and sediment sampling activities associated with the Corrective Measures (CM) to be implemented at the Superior Tube Company (Superior) facility in Lower Providence Township, Montgomery County, Pennsylvania (the Site). This FSP was prepared to satisfy the requirements of Attachment A, Task II.F of the 28 December 1998 Administrative Order on Consent (AOC) between Superior and the United States Environmental Protection Agency (USEPA), as well as relevant EPA RCRA Corrective Action Plan guidance.

1.2 GENERAL APPROACH

Pursuant to Attachment A, Section C of the AOC, the CM activities will include the final delineation, excavation, and off-site disposal of impacted soils within Solid Waste Management Unit (SWMU) 6 (Outfall 002 area), SWMU 8 (Outfall 004 area), and SWMU 17 (Scrap Metal Storage Area).

Delineation sampling will be conducted to determine the extent of soils that exceed the media-specific cleanup standards established in the AOC. Delineation sampling will be conducted prior to excavation so as to minimize the duration of open excavations and facility disruption that would otherwise be required while waiting for post-excavation sampling results prior to backfilling, and the potential need for additional excavation. Pre-excavation delineation will also enable better planning of equipment and materials required for the project. In addition, waste classification samples will be collected prior to excavation so that an appropriate off-site recycling or disposal facility can be confirmed, and the waste stream accepted. To avoid redundancy, post-excavation samples will only be collected in locations where the pre-excavation delineation samples may not have fully defined the extent of excavation and constituent concentrations to remain in place. Analysis of samples will be limited to those constituents which exceed the media-specific criteria and which have not been delineated.

If delineation sampling results indicate that the extent and/or volume of material exceeding the media cleanup standards are much greater than

that previously assumed, the results will be reported to the EPA immediately, and alternate corrective measures may be considered.

1.3

SWMUS 6 AND 8 (OUTFALLS 002 AND 004)

As per the AOC, surface soils and sediments that exceed the applicable media-specific cleanup standards in the vicinity of Outfalls 002 and 004 (SWMUs 6 and 8, respectively) will be excavated and transported off-site for disposal. As discussed above, delineation sampling will be conducted prior to excavation so as to enable better planning and quicker backfilling and restoration. Based on previous results, delineation sampling will be required to define the lateral and vertical extent of materials exceeding the media-specific cleanup standards in the outfall areas. As stated previously, post-excavation samples will only be collected in locations where the pre-excavation delineation samples may not have fully defined the extent of excavation required in all directions.

A summary of the previous sampling results, AOC cleanup criteria, and proposed delineation sampling locations are presented on Figures 1 and 2 for Outfalls 002 and 004, respectively. Figures 1 and 2 only show the results for those constituents which demonstrated one or more exceedances of the cleanup criteria in that area. Based on a comparison of constituent concentrations detected in surface soils and sediments at Outfalls 002 and 004 to the AOC media cleanup standards, benzo(a)pyrene is the sole constituent of concern in the outfall areas.

The proposed additional delineation samples are shown on Figures 1 and 2, with additional information summarized on Table 1. In general, the proposed additional delineation samples will be placed outward from or below the location of previous samples where the AOC criteria were exceeded, but not bounded by a corresponding sample with concentrations below the cleanup criteria. Although not shown on Figures 1 and 2 and Table 1, additional, "contingency" samples will be collected outward and downward from at least some of the proposed samples represented on Figures 1 and 2 and Table 1. Each contingency sample will only be analyzed if the initial sample from that location is found to exceed the media cleanup criteria, indicating that the delineation is not complete. Coordination with the laboratory will be maintained to ensure that sample holding times are not exceeded. If the delineation is still not complete following the analysis of the initial and contingency samples, additional delineation sampling will be conducted, or the EPA will be contacted to review alternate plans. If only minor delineation remains, the delineation may be completed via post-excavation sampling.

Table 1
Sample Summary Matrix for Delineation Activities
Corrective Measures Activities
Superior Tube Company
Evansburg, Pennsylvania

Sample Location	Depth	Analyses
<u>Outfall 002 Area (SWMU 6)</u>		
002SD-1	0-1'	benzo(a)pyrene
002SD-2	0-1'	benzo(a)pyrene
002SD-3	0-1'	benzo(a)pyrene
002SD-4	0-1'	benzo(a)pyrene
002SD-5	0-1'	benzo(a)pyrene
002SD-6 (RFI SD-4 location)	2-2.5'	benzo(a)pyrene
002SD-7 (RFI SD-5 location)	2-2.5'	benzo(a)pyrene
<u>Outfall 004 Area (SWMU 8)</u>		
004SD-1	0-1'	benzo(a)pyrene
004SD-2	0-1'	benzo(a)pyrene
004SD-3	0-1'	benzo(a)pyrene
004SD-4	0-1'	benzo(a)pyrene
004SD-5	0-1'	benzo(a)pyrene
004SD-6	0-1'	benzo(a)pyrene
004SD-7	0-1'	benzo(a)pyrene
004SD-8	0-1'	benzo(a)pyrene
004SD-9	2-2.5'	benzo(a)pyrene
002SD-10 (RFI SD-5 location)	2-2.5'	benzo(a)pyrene
<u>SWMU 17</u>		
17SS-1	2-2.5'	Co, Cu, Ni
17SS-2	2-2.5'	Co, Cu, Ni
17SS-3	2-2.5'	Co, Cu, Ni
17SS-4	2-2.5'	Co, Cu, Ni
17SD-1	0-1'	As, Co, Cu, Ni
17SD-2	0-1'	As, Co, Cu, Ni
17SD-3 (RFI SD-1 location)	2-2.5'	As, Co, Cu, Ni
17SD-4 (RFI SD-3 location)	2-2.5'	As, Co, Cu, Ni

Notes:

- Additional samples may be collected and analyzed as discussed in the Field Sampling Plan.
- The type and number of quality assurance/quality control samples will be based on the Quality Assurance Project Plan, and will depend on the number of days spent in the field.
- Benzo(a)pyrene will be analyzed by EPA Method SW-846 8270C.
- Metals will be analyzed by EPA Method SW-846 6010B.
- As = Arsenic, Co = Cobalt, Ni = Nickel, Cu = Copper

If bedrock is encountered along a delineation boundary, or if no soils or sediments are present as a result of some other feature (e.g., concrete headwall), the delineation will be considered complete in that direction.

Because the outfall areas both receive runoff from paved surfaces and roads that are not associated with the operations of Superior, and because benzo(a)pyrene is a component of car exhaust and a common contaminant in roadway runoff, it is possible that the presence of benzo(a)pyrene in the outfall areas is at least partially a result of such runoff. If widespread benzo(a)pyrene contamination is revealed through the delineation sampling, and the depth, area and/or volume of materials exceeding the media-specific cleanup standards is significantly greater than that estimated for this CM design, Superior may petition the EPA for consideration of an alternate remediation approach prior to excavation.

1.4

SWMU 17

As per the AOC, soils and sediments at SWMU 17 that exceed the media-specific cleanup standards presented in the AOC will be excavated to a maximum depth of 3 feet, and transported off-site for proper recycling or disposal. As discussed above, delineation sampling will be conducted prior to excavation so as to enable better planning and quicker backfilling and restoration. Based on previous results, delineation sampling will be required to better define the lateral and vertical extent of materials exceeding the media-specific cleanup standards. As stated previously, post-excavation samples will only be collected in locations where the pre-excavation delineation samples may not have fully defined the extent of excavation required in all directions.

A summary of the previous sampling results, AOC cleanup criteria, and proposed delineation sampling locations are presented on Figure 3 for SWMU 17. Figure 3 only shows the results for those constituents which demonstrated one or more exceedances of the cleanup criteria at SWMU 17. Based on a comparison of constituent concentrations detected in surface soils and sediments at SWMU 17, the constituents of concern include benzo(a)pyrene, arsenic, cobalt, copper, and nickel.

The proposed additional delineation samples are shown on Figure 3, with additional information summarized on Table 1. In general, the proposed additional delineation samples will be placed outward from or below the location of previous samples where the AOC criteria were exceeded, but not bounded by a corresponding sample with concentrations below the cleanup criteria. Consistent with the maximum required depth of

excavation, no sampling will be conducted below a depth of 3 feet. Although not shown on Figure 3 or Table 1, additional, "contingency" samples will be collected outward and downward (to a maximum depth of 3 feet) from at least some of the proposed samples represented on Figure 3 and Table 1. Each contingency sample will only be analyzed if the initial sample from that location is found to exceed the media cleanup criteria, indicating that the delineation is not complete. Coordination with the laboratory will be maintained to ensure that sample holding times are not exceeded. If the delineation is still not complete following the analysis of the initial and contingency samples, additional delineation sampling will be conducted, or the EPA will be contacted to review alternate plans. If only minor delineation remains, the delineation may be completed via post-excavation sampling.

Because the surface and subsurface overburden materials at SWMU 17 and surrounding areas have been characterized as imported fill, constituent concentrations detected in SWMU 17 delineation samples may be representative of background conditions, rather than former operations at SWMU 17. If this condition is revealed through the delineation sampling activities, and the volume of materials exceeding the media-specific cleanup standards is significantly greater than the 150 cubic yards estimated in the AOC, Superior may petition the EPA for consideration of an alternate remediation approach.

Following excavation, excavated areas will be backfilled with imported clean soil, and capped with asphalt to prevent future exposures to constituents that are left in place.

2.0 FIELD SAMPLING ACTIVITIES

2.1 SOIL AND SEDIMENT SAMPLING

In general, soil and sediment sampling will be completed with a pre-cleaned hand bucket auger or stainless steel trowel in accordance with the general procedures utilized during the RCRA Facility Investigation (RFI). In paved areas, a power auger or small backhoe will be utilized to remove overlying materials prior to sample collection at the target depth. Samples will generally be grab samples representative of a discrete 6-inch interval. Surface soil and sediment samples may reflect a composite over a 1-foot interval in locations where it would impractical to remove only 6 inches. Once brought to the surface, the soil will be transferred to the appropriate sample containers using a stainless-steel spoon. Any spoils generated during the sampling activities will be returned to their original location following removal of the portion for laboratory analysis.

2.3 DECONTAMINATION OF SAMPLING EQUIPMENT

The number of soil samples to be collected will necessitate field decontamination of soil sampling equipment such as bucket augers and sampling spoons. This will be performed by completing a manual scrub with an Alconox® soap or similar detergent solution, a tap water wash, and finally a distilled and deionized water rinse. This process will be repeated until visual contamination is not present. For sampling of metals, a nitric acid rinse will also be performed, followed by a distilled and deionized water rinse. Decontamination water will be contained in a 55-gallon drum for subsequent discharge to the on-site water treatment plant, or for off-site disposal.

2.4 FIELD MEASUREMENTS AND FIELD NOTEBOOKS

A bound field notebook will be maintained to record the field sampling activities. The first page in the notebook will contain the site name, date and time started and the personnel on site. The entry for each new day will include the date and time started, weather, personnel on site, and sampling information. The sampling information will include:

- Sample # (Traffic Report);

- Date and time of sample collection;
- Sample location (document with a site sketch and/or written description);
- Sampling method (hand auger, SS spoon, etc.);
- Analysis and QA/QC requirements;
- Field observations (significant observations will be documented);
- Sample shipping information, date and time of shipment, destination, notations on inclusion of legal seals for transport containers; and
- Comments (observations or events that occurred that would be relevant to the site; for example, weather changes, conversations with the client, public officials or private citizens, etc.).

2.5 *QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES*

Quality assurance and quality control procedures including sample bottles and preservatives, chain-of-custody, sample preservation and packaging, type and frequency of quality assurance samples, analytical procedures, and data reduction, reporting and validation will be performed according to the provisions of the CM Quality Assurance Project Plan (QAPP).

2.6 *HEALTH AND SAFETY*

All field sampling activities will be performed in accordance with the health and safety protocols presented in the CM Health and Safety Plan.

2.7 *SURVEYING*

All soil sampling locations will be staked and surveyed for location and ground elevation by a Pennsylvania-licensed professional land surveyor. The surveyed locations will be transferred to existing site maps for future reference. Excavation activities will be conducted based on the staked and surveyed sample locations.

DATA EVALUATION AND REPORTING

Upon receipt, review and validation of the sampling data, a summary report will be prepared and submitted to the EPA for review prior to the initiation of soil excavation and disposal activities.

Appendix E
Operation and Maintenance Plan

Superior Tube Company

Corrective Measures

Operations and Maintenance (O&M) Plan

Superior Tube Company

Evansburg, Pennsylvania

17 August 1999

Environmental Resources Management, Inc.

855 Springdale Drive
Exton, Pennsylvania 19341

OPERATION AND MAINTENANCE PLAN

1.0 Introduction

This plan summarizes the Interim Measure (IM) and Corrective Measure (CM) operation and maintenance (O&M) activities to be conducted at the Superior Tube Company (Superior) facility in Lower Providence Township, Montgomery County, Pennsylvania (the Site). In general, these activities involve periodic inspections and sampling, routine operation and maintenance activities, and unscheduled maintenance activities that are conducted on an "as-needed" basis to respond to conditions that may be identified during periodic site inspections.

The major IM and CM components that require on-going operation and maintenance consist of the following:

- Trichloroethene (TCE) ground water recovery and treatment system;
- Solid Waste Management Unit (SWMU) 21 ground water recovery and treatment system; and
- SWMU 17 asphalt cover.

To support the inspection and maintenance program outlined below, and to further ensure the long-term effectiveness of the IMs and CMs, periodic sampling of treatment system effluent and on-site and off-site ground water has been and will continue to be conducted as detailed in other CM program documents. Plans for operation, maintenance and monitoring of the in-situ vacuum extraction (ISVE) pilot system are also presented separately.

2.0 Inspection and Monitoring Program

Visual inspection of the Site will be performed semi-annually during the period that active corrective measures or passive engineering or institutional controls are required to protect human health and/or the environment from potentially unacceptable exposure risks.

Inspection/maintenance frequency may also be increased or decreased at any time during the monitoring period if warranted by site conditions.

This visual monitoring and inspection program shall include the following observations:

1. Inspection of the SWMU 17 asphalt cap for:
 - a. Excessive cracking of the asphalt cap.

- b. Evidence of exposed soils.
- 2. Inspection of the ground water recovery and treatment systems for:
 - a. Condition of recovery wells, monitoring wells, sumps, pumps, and associated pipes and controls.
 - b. Leaks or blockages in or around any part of the systems.
 - c. Excessive iron build-up, sludges, or other factors which could compromise the effectiveness of the air strippers, activated carbon, and other treatment components.
- 3. Inspection of other areas of the Site for changing conditions which could jeopardize the effectiveness of the IMs and CMs, or which could result in potentially unacceptable risks requiring additional IMs or CMs.

In addition to comprehensive, semi-annual inspections, periodic (generally weekly to monthly) monitoring of the active ground water recovery and treatment systems will be conducted in accordance with existing plans and policies. These monitoring activities include total flow and water level measurements from recovery wells and sumps, and treatment system effluent sampling

3.0 *Maintenance*

Maintenance activities include routine and non-routine adjustments, replacements and repairs conducted to maintain the integrity of the corrective measures. Routine activities are conducted on a pre-determined, scheduled basis, and non-routine maintenance activities will be conducted based on the results of sampling, monitoring or inspections. The frequency of routine maintenance will generally continue according to current plans, although the frequency will be adjusted as needed based on seasonal variations, the results of inspection and monitoring activities, and/or professional judgement. The major maintenance activities for the IM and CM components are discussed below.

3.1 *TCE Ground Water Recovery and Treatment System*

- 1. Wells/Pumps – Maintenance of the monitoring wells, recovery wells, and pumps that comprise the TCE ground water recovery system is generally performed on an as-needed basis based on periodic inspections and monitoring. Maintenance activities include replacement of leaky well covers, and repair or replacement of pumps and/or level controls when operation is faulty. Monitoring and recovery wells will be redeveloped or replaced in the future if recovery rates decrease below desired levels.

2. Air Strippers – Maintenance of the air strippers will be performed on an as-needed basis, and will include replacement of switches, blowers, pumps, and controls when determined to be faulty. Tower packing media will be replaced if removal efficiencies decrease below desired goals.
3. Carbon Filters – Granular activated carbon (GAC) that is present within the on-site carbon columns will be regenerated or replaced when effluent concentrations reach 25% of the monthly average NPDES discharge limitations, or more frequently as determined appropriate by maintenance personnel. The primary and secondary carbon columns will be switched during change-out of the primary carbon. Carbon filters that are currently installed on residential and commercial wells will be monitored and replaced according to the Schedule for Maintenance and Replacement of Carbon Filter Systems, presented to the EPA on 13 January 1999.

3.2 *SWMU 21 Recovery and Treatment System*

1. O&M of the SWMU 21 ground water recovery and treatment system includes the collection of ground water at existing sumps, pumping of the water to an on-site treatment system, chemical addition, metals precipitation and removal, sludge dewatering and disposal, and effluent sampling. This system is generally monitored and maintained on a daily basis. Superior is currently completing the construction of a new, larger on-site water treatment plant, and ground water collected as part of the SWMU 21 recovery program will be directed to this plant once completed. O&M will then be conducted as part of the required O&M for the new treatment plant.

3.3 *SWMU 17 Asphalt Cap*

1. The asphalt cap for the SWMU 17 area is a passive remedial measure that does not require any active operation. Based on the durability and variable weathering of asphalt, maintenance of the SMWU 17 cap will be performed on an as-needed basis only. Repairs will generally include crack filling, patching, and/or resurfacing as necessary to prevent potentially unacceptable direct contact exposures with impacted subsurface soils.

4.0 *Reporting*

The person(s) performing the inspection and maintenance activities will prepare a report following each inspection utilizing appropriate forms. Inspection and maintenance forms have previously been used by Superior to support periodic inspections and maintenance, and these forms are updated periodically to reflect changes in the status of site conditions or

equipment capabilities. These reports will be maintained in a project record file. The person(s) performing the inspections shall immediately communicate to the Project Manager or a designated representative any conditions found which he/she believes require immediate attention, such as conditions that are causing or could cause the release of contaminated materials to the environment. If deemed necessary, the services of a contractor or contractors will be retained to identify and/or implement appropriate corrective measures.

As appropriate, significant results from inspection, monitoring and maintenance activities will be reported to the EPA and PADEP as part of the periodic progress reports required by the Administrative Consent Order (effective date 28 December 1998). To the extent that conditions permit, EPA and PADEP will be notified in advance of any significant corrective measures proposed or implemented.

5.0 *Health and Safety*

Inspection and maintenance personnel will be required to follow the health and safety guidelines presented in the CM Health and Safety Plan to the extent applicable.

6.0 *Quality Assurance*

The quality assurance activities and protocols for implementation of the O&M activities is presented in the CM Quality Assurance Project Plan.

Appendix F
Draft Deed Notice

DEED NOTICE

This Deed Notice is made as of the ____ day of _____, 1999, by Superior Tube Company, a ____ corporation ("Superior" or the "Owner"). This Deed Notice is applicable to a portion of the Superior facility located at the intersection of Germantown Pike and Cross Keys Road in Evansburg, Montgomery County, Pennsylvania, identified as Parcel __ on the tax map of Lower Providence Township (identified herein as the "Property").

In accordance with the 28 December 1998 Final Administrative Order on Consent between Superior and the United States Environmental Protection Agency Region III, this Deed Notice is recorded as an institutional control to identify the existence of certain ground water at the Property, and to limit certain activities at the Property which could increase the risk of exposure to such contamination to humans or the environment, to the extent set forth below.

WITNESSETH:

WHEREAS, Owner owns certain real property designated as Parcel ____ on the tax map of Lower Providence Township, Montgomery County, Pennsylvania, shown on the map in Exhibit A attached hereto, and more particularly described in the respective deeds to Superior dated _____ and recorded in the Office of the Recorder of Deeds in and for Montgomery County, Pennsylvania, as follows: _____; and

WHEREAS, the United States Environmental Protection Agency Region III approved the use of institutional controls and/or engineering controls as part of the Resource Conservation and Recovery Act (RCRA) Corrective Measures at the Property in accordance with the 28 December 1998 Final Administrative Order on Consent between Superior and the United States Environmental Protection Agency Region III (U.S. EPA Docket No. RCRA-III-081-CA); and

WHEREAS, this Deed Notice itself is not intended to create any interest in real estate in favor of the United States Environmental Protection Agency, nor to create a lien against the Property, but merely is intended to provide record or deed notice of certain restrictions on the Property; and

WHEREAS, the Property contains or may contain contaminants in ground water above the media cleanup standards specified in the 28 December 1998 Final Administrative Order on Consent that would allow for the unrestricted use of the Property; and

WHEREAS, to prevent the potential for exposure to the contamination to humans or the environment, a ground water recovery and treatment system is in place at the Property to treat impacted ground water, and asphalt capping is in place at various locations to prevent long-term direct contact with contaminated soils. These engineering controls will be periodically inspected and maintained by Owner as necessary to prevent long-term, uncontrolled exposure to ground water; and

WHEREAS, in accordance with the 28 December 1998 Final Administrative Order on Consent between Superior and the United States Environmental Protection Agency Region III, Owner has agreed to subject the Property to certain notices, as set forth below.

NOW, THEREFORE, Owner subjects the Property to notice as follows:

1. NOTICE. Owner and any successor owner of the Property is required to: (a) maintain the existing security system, and take necessary measures to prevent access of unauthorized personnel to the facility during implementation of corrective measures, (b) prohibit construction activities which would interfere with the corrective measures and/or damage any equipment associated with the corrective measures at the Property, and (c) prohibit installation of on-site drinking water wells, without adequate treatment, in areas of the Property within the ground water contaminant plume. This Deed Notice shall be deemed to be appended to the deed or deeds to the Property in order to identify the existence of contaminated ground water beneath the Property, and to provide a warning that ground water under the Property should not be consumed without adequate treatment.
2. NOTICE TO RUN WITH LAND. This Deed Notice shall run with the land, and shall serve as notice to each owner or operator of all or any portion of the Property.
3. NO RIGHTS. This Deed Notice is made for the limited purpose of satisfying Owner's obligation under the 28 December 1998 Final Administrative Order on Consent, and is not intended to, nor shall it, create any right, private or public, in any person or entity for any purpose whatsoever.
4. TERMINATION AND MODIFICATION. If warranted by changing site conditions, environmental regulations, or technical information, any person may request from the United States Environmental Protection Agency Region III that this Deed Notice be modified or terminated.

IN WITNESS WHEREOF, Owner has executed this Deed Notice as of the date first written above.

ATTEST:

Superior Tube Company

[name & title]

By: _____
[signature & date]

COMMONWEALTH OF PENNSYLVANIA SS.:

COUNTY OF MONTGOMERY COUNTY

I certify that on ___, 1999, _____ personally came before me, and this person acknowledged under oath, to my satisfaction, that:

(a) this person is the _____ [secretary /assistant secretary] of Superior Tube Company, the corporation named in this document;

(b) this person is the attesting witness to the signing of this document by the proper corporate officer who is the _____ [president/vice president] of the corporation;

(c) this document was signed and delivered by and on behalf of Superior Tube Company, as its voluntary act and was duly authorized;

(d) this person knows the proper seal of the corporation which was affixed to this document; and

(e) this person signed this proof to attest to the truth of these facts.

[print name and title of attesting witness]

Signed and sworn before me on

_____, 1999

_____, Notary Public

[Print name and title]

EXHIBIT A

Metes and Bounds Description of Property

(Attach a tax map of the site which shows the metes and bounds and the block and lot numbers of the site)